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Dr. Hirsch devotes nearly one-third of his book to the defense of Richard Wagner. He must have felt that his hero was hard pressed. The great majority of his readers will, no doubt, believe that he has maintained his thesis and established his hero on a sane and solid basis. We are not at all unwilling to accept his position. But it is an interesting fact that the Wagner vogue, aside from Germany, has reached its greatest popularity in this country, a land which has, with equal fervor, taken to its heart spiritualism, homœopathy, Christian science and free coinage. Dr. Hirsch has, in general, reasoned well and shown both the learning of an alienist and the scholarship of a literateur. But we are grieved to see him descend to the cheap sophism that Nordau, by his own rules, has shown himself a degenerate. This brilliant touch has been applied before by three-fourths of the penny-aliners who have attacked his work. While it may be suggested by Nordau's extravagant invective, it is simply not a logical retort. For it makes no difference what the author of an argument is. It is the force of the facts upon which it is based that concerns the critic.

CHARLES L. DANA.

NEW YORK.

SCIENTIFIC JOURNALS.

AMERICAN JOURNAL OF SCIENCE.

THE March number opens with an article by J. S. Diller, of the United States Geological Survey, describing Crater Lake, in southern Oregon. This lake is situated in the summit of the Cascade Range, and, notwithstanding the interest of its geological history and the beauty of the natural scenery, a comparatively small part of the scientific public is acquainted with its features. The nearly circular rim of the lake has an average diameter of six miles and rises 1,000 feet above the general level of the range. The slope without is gentle, but within quite precipitous. The general appearance is that of the hollow base of a large and deeply truncated cone, filled within by the waters of the lake. The crest of the rim varies in height from 6,700 to 8,200 feet above the sea, or from a little more than 500 to nearly 2,000 feet above the waters of the lake. The rim is composed of lava streams and beds of volcanic con-

glomerate, which dip away from the lake. The prevailing rock is andesite, but rhyolites are common along the later flows and these are largely associated with pumice. A number of vertical dikes intersect the rim, the largest of which is known as the Devil's Backbone. Within the lake is an island called Wizard's Island, which consists of a steep cinder cone 845 feet in height, surmounted by a perfect crater 80 feet in depth and encircled by a rough lava field. According to soundings taken by Dutton in 1886, other prominences of this kind exist at the bottom of the pit. The rim of the lake has been extensively glaciated, and the study of the glacial striæ and moraines gives evidence of the changes which have taken place since the glacial period.

After discussing the prominent features of the locality, some of which are here alluded to, the author concludes that in the glacial period the site of Crater Lake was occupied by an active volcano about the height of Mt. Shasta; this has been called Mt. Mazama. Its sides were glaciated by the descending ice streams, and moraines were deposited about its base. The author concludes as follows:

"The later eruptions of Mt. Mazama occurred in the glacial period and doubtless produced extensive floods which filled with débris the valleys of all the streams radiating from the mountain. In approximate connection with its final eruption, the molten material of the interior withdrawing, the summit of Mt. Mazama caved in and sank away, giving rise to a caldera nearly six miles in diameter and 4,000 feet deep. Thus originated the great pit in which Crater Lake is contained, encircled by a glaciated rim, the hollow base of the engulfed Mt. Mazama. Upon the bottom of the caldera volcanic activity continued. There were new eruptions building up cinder cones and lava fields and partially refilling the great pit. Precipitation is greater than evaporation in that region. Volcanic activity ceasing, the conditions were favorable for water accumulation and Crater Lake was formed in the pit."

F. D. Adams and A. E. Barlow discuss the origin and relations of the Grenville and Hastings series in the Canadian Laurentian. This is in continuation of an earlier paper by the

first author on the same general subject. The region now especially described lies to the north of Lake Ontario, along the margin of the Protaxis. The nature of the various igneous rocks which make up the Fundamental Gneiss is described, and then the Grenville series, differing from the former in containing certain rocks whose composition marks them as highly altered sediments, for example, limestone and certain gneisses, either having a composition approaching ordinary shale and slate or highly siliceous, and thus corresponding to sandstones. The whole has been invaded by great masses of the so-called Fundamental Gneiss. The southeastern portion of the area is underlain by the Hastings series, characterized particularly by fine-grained bluish or grayish limestones and dolomites, differing from those of the Grenville series in being comparatively unaltered; these are cut through by intrusions of gabbro-diorite and granite. The contact of the Fundamental Gneiss and the Grenville series appear to a contact of intrusion; further, as regards the relation of the two series to each other, observations thus far made indicate that the Hastings series represents the Grenville in a less altered form. That is, "the Hastings series, when invaded, disintegrated, fretted away and intensely metamorphosed by and mixed up with the underlying magma of the Fundamental Gneiss, constitutes what has elsewhere been termed the Grenville series." "Like the Grenville series, the rocks of the Hastings series are unconformably overlain by and disappear beneath the flat-lying Cambro-Silurian rocks of the plains, which limit the Protaxis on the south and are separated from it in time by an immense erosion interval." The authors add that if the explanation reached is correct, the Laurentian system of Logan will resolve itself into an enormous area of the Fundamental Gneiss, which is essentially of igneous origin and which there is every reason to believe forms part of the downward extension of the original crust of our planet, perhaps many times remelted and certainly in many places penetrated by enormous intrusions of later date; into which Fundamental Gneiss, when in a softened condition, there have sunk portions of an overlying series, consisting chiefly of limestones.

The paper closes with some remarks by R. W. Ells, describing observations made by him in the region adjoining to the east, which confirm and extend the conclusions of the other authors named.

C. E. Beecher gives (pp. 181-207) the conclusion of his exhaustive paper on the Natural Classification of the Trilobites, closing with an index list of the genera included. F. B. Taylor describes the various forms of scoured boulders in the Mattawa Valley, in the Province of Ontario. A number of distinct varieties of the boulders are recognized; as those reduced to a ring form, others with a basin-like hollow, and finally those which are faceted or simply smoothed. The special conditions under which each type was probably produced are discussed at length, and it is shown that the evidence is very strong in favor of the supposition of a former outlet of the Upper Great Lakes along the present course of the Mattawa River.

C. Barus discusses some observations on the excursions of the diaphragm of a telephone made with the special interference apparatus described in the February number. It is concluded, for example, that in the case of telephonic sounds of faint but distinct audibility the excursions of the plate cannot be greater than 3×10^{-6} cm., and are probably even below 10^{-6} cm. A computation of the force coming upon the plate in certain cases gives 141 dynes as the force at the center. R. S. Tarr describes the action of Arctic sea ice in geological work; from observations made at various points in the high north. The nature of sea ice and glacial ice is spoken of, the influence of sea-made ice on erosion, further the erosion by glacial ice, and the transportation accomplished by both kinds.

W. O. Crosby gives the results of his study of the geology of Newport Neck and Conanicut Island, especially with reference to the relation existing between the granite and the sedimentary rocks. The latter consist in part of Carboniferous slates, in part of flinty slate, which resembles the Middle Cambrian slates of the Boston Basin. The author does not accept the view of Pirsson, that the flinty slate grades into the highly fissile Carboniferous slates, but re-

gards his observation as proving that the two formations are distinct. The arkose which forms a continuous belt separating the flinty slate and the unaltered green shales is believed to be a regular member of the Carboniferous series. F. A. Gooch discusses the use of hydriodic acid in the estimation of molybdenum. This subject was treated in 1806, by Goosh and Fairbanks, but their methods were criticised by Friedheim. The present article shows that certain errors of calculation in an earlier paper by Friedheim and Euler vitiate the conclusions reached in the criticism referred to. I. C. Russell gives an abstract of the results of recent observations in southeastern Washington, especially as regards the immense lava fields of the region and the gorge formed through them by the Snake river; this is said to rival the Grand Canyon of the Colorado in grandeur, though lacking its brilliant coloring.

SOCIETIES AND ACADEMIES.

PHILOSOPHICAL SOCIETY OF WASHINGTON.

THE Philosophical Society of Washington held its 464th meeting on the 20th inst, at which E. D. Preston, of the United States Coast and Geodetic Survey, read a paper on 'The Transcontinental Arc from Cape May to San Francisco,' which was followed by a paper by Wm. Eimbeck, of the same Survey, on 'The New Primary Base Apparatus,' used by the Survey, illustrated by one of the bars mounted. Mr. J. Howard Gore read a paper on 'A Dutch Practical Charity,' and Charles R. Dodge read a paper on 'Systematic Classification of Textile and other useful Fibers of the World,' illustrated by samples.

BERNARD R. GREEN,
Secretary.

SCIENCE CLUB OF THE UNIVERSITY OF WISCONSIN, JANUARY 18, 1897.

THE subject, 'Modern Methods of Milk Preservation,' was presented by Professor H. L. Russell. He divided the different methods proposed into three classes: 1. Those excluding bacteria from the milk; 2, those inhibiting the development of bacteria as in condensed or preserved milk, or where milk is kept at

temperatures too low for bacterial growth; and 3, those in which bacteria are actually destroyed, as in the various methods where heat is employed, as in pasteurization and sterilization. He also discussed the new method, devised by Dr. Babcock and himself, of restoring the consistency to pasteurized milk products. Mr. Louis Kahlenberg, in his paper, 'The Toxic Action of Dissolved Salts and their Electrolytic Dissociation,' gave, as an introduction, a brief explanation of the theory of electrolytic dissociation and the reasons for holding the same. The general proposition was made that the physiological action of a solution of an electrolyte depends on the action of the undissociated molecules, together with that of the ions present. The results of many experiments upon plants performed by the author and Mr. R. H. True and Mr. F. D. Heald were cited to substantiate this view. It was further pointed out that experiments on bacteria performed at the University, and recent investigations carried on at the University of Leipzig, further confirm the general proposition which was first published in the *Botanical Gazette* of August, 1896, by Kahlenberg and True. The significance of the discovery to physiological chemistry, agriculture, bacteriology and therapeutics was briefly mentioned.

WM. S. MARSHALL,
Secretary.

NEW BOOKS.

A Treatise on Analytical Statics. EDWARD JOHN ROUTH. Cambridge University Press. New York, The Macmillan Company. 1896, 1892. Vol. I. Pp. xii+301. Vol. II. Pp. xii+224.

Elementary Text-book of Physics. WM. A. ANTHONY and CYRUS F. BRACKETT. Revised by W. F. MAGIE. 8th edition. New York, John Wiley & Sons. London, Chapman & Hall, Ltd. 1897. Pp. viii+512. \$4.00.

Researches upon the Antiquity of Man. HENRY C. MERCER. Boston, Ginn & Co. 1897. Pp. 178.

Die Chemie in täglichen Leben. DR. LASSAR-COHN. Hamburg and Leipzig, Leopold Voss, 1807. 2d edition. Pp. vii+303. 4 M.